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NAVAL AIR SYSTEMS COMMAND
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IN REPLY REFER TO

NAVAIRINST 13100.15
AIR-4.1

30 March 2002

NAVAIR INSTRUCTION 13100.15

From: Commander, Naval Air Systems Command

Subj: ENGINEERING TECHNICAL REVIEW OF COMMERCIAL-DERIVATIVE
AIRCRAFT PROGRAMS

Ref: (a) OPNAVINST 3710.7S
(b) NAVAIRINST 13034.1B
(c) NAVAIRINST 5100.11
(d) NAVAIRINST 4355.19A

Encl: (1) Engineering Technical Review of New Commercial-Derivative Aircraft
Acquisition or Major Modification Programs
(2) Engineering Technical Review of Existing Commercial-Derivative
Aircraft In-Service Engineering and Logistics Support Actions

1. Purpose. To promulgate and implement the policy for engineering technical review of commercial-derivative aircraft programs. This policy integrates Federal Aviation Administration (FAA) and commercial industry certification practices and data into the established Naval Air Systems Command (NAVAIR) processes. The goal is to provide modern systems to our warfighters, while ensuring safety and confidence through strong engineering technical review. References (a) through (d) provide additional guidance to assist with implementation of this policy.

2. Scope. This instruction applies to all personnel and agencies of NAVAIR involved in acquisition and/or Test and Evaluation (T&E) of commercial-derivative aircraft/systems.

3. Background

a. Navy operational requirements can sometimes be satisfied by aircraft and equipment not developed specifically for the Navy. The design, test, and demonstration criteria for commercial aircraft are generally different from those required of aircraft developed for the Navy. The Department of the Navy (DoN), as part of its streamlining strategy, encourages increased reliance on commercial processes, products and services, and reduced reliance on military unique standards whenever possible. The Navy may also acquire commercial-derivative aircraft/systems for employment in Navy unique mission areas and operational environs that differ from those intended by the Original Equipment Manufacturer (OEM) and authorized under FAA certification processes. These differences in mission or system usage must be identified early in the acquisition program process.

b. Reference (a) establishes NAVAIR as the cognizant technical authority for all naval aircraft. As such, NAVAIR establishes and has cognizance over all aircraft/equipment limitations, and technical data in Naval Air Training and Operating Procedures Standardization (NATOPS) publications, and is responsible for ensuring the airworthiness of all naval aircraft configurations. The National Airworthiness Team (NAT), headed by the Flight Clearance Officer (FCO), Airworthiness Office (AIR-4.0P), issues flight clearances as described in Reference (b). Flight clearances are required for all Navy aircraft prior to operation outside the limits and/or configurations established as standard by NATOPS, prior to issuance of a NATOPS, pending distribution of a Technical Directive (TD), and/or pending change(s) to the NATOPS and/or Tactical Manual (TACMAN).

4. Policy

a. In consonance with the above strategies, program teams shall accept the integrity of FAA processes, commercial certifications, methods, processes, and procedures utilized in the commercial aircraft industry. Acceptance of commercial certification shall include the acceptance and use of FAA-issued Type Inspection Authorizations (TIAs), Type Certificates (TCs), Supplemental Type Certificates (STCs), and supporting certification data.

b. It is imperative that NAVAIR and users agree as early as possible on the intended Navy operational usage spectrum and support concept of the end product, and how it will satisfy the operational requirements. This utilization includes, but is not limited to, training philosophy, maintenance plan, operational envelopes, flight profiles, environmental factors, etc. This information, when compared with FAA common data, will define Navy unique requirements.

c. In order to ascertain the extent to which Navy operational use, training, and maintenance will fit within the commercial certification, NAVAIR shall conduct engineering technical reviews. Engineering technical review planning shall begin within NAVAIR as soon as possible during the formulation or identification of a new Commercial-Derivative Aircraft (CDA) program or aircraft modification. NAVAIR engineering shall be afforded the opportunity to engage in technical dialogue with OEM engineering in order to identify/clarify Navy unique usage and support issues. Navy unique usage and support will be incorporated into the commercial/FAA certification to the maximum extent possible.

(1) Navy unique usage and support aspects not covered by commercial certification will be captured as technical risks, with defined requirements for data/analyses to demonstrate risk mitigation. The risks will be derived by engineering from the usage spectrum that is identified by the customer, and briefed to NAVAIR by the Assistant Program Manager, Systems and Engineering (APMSE) and/or Program Manager, Air (PMA); and

(2) Together with the Commercial/FAA Certification, data and analysis will be coordinated through the AIR-4.x engineering disciplines by the APMSEs to ensure engineering is performed with analysis and resulting risk mitigation. Upon concurrence of the working level engineers, the Flight Clearance Performance Monitors, or empowered engineers will “chop” the flight clearance to demonstrate that adequate risk mitigation has been accomplished.

d. Where NAVAIR has determined that a proposed aircraft modification is within an existing TC or STC, and the intended mission/usage is consistent with the OEM/FAA, then the engineering technical review of airworthiness and service life shall be based on the commercial certification. In order to minimize cost and schedule impacts associated with redundant engineering and test efforts, NAVAIR shall rely, to the maximum extent possible, on OEM/FAA commercial practices, resultant certifications, and technical data during conduct of engineering technical reviews of airworthiness and service life limits.

e. In summary, NAVAIR policy for issuing flight clearance for CDA is based on the FAA issued TIA/TC/STCs and a NAVAIR engineering assessment of risk against Navy unique usage. It is imperative that Navy unique usage and support requirements are clearly stated in the CDA Program's contractual documentation. Additionally, the contract documentation must provide for the appropriate technical data, and accommodate sufficient technical reviews to enable the above policies.

5. Participants. The process participants for a typical Integrated Program Team (IPT) include:

- a. PMA/IPT Leader/Contractor Team;
- b. Assistant Commander for Contracts Group (AIR-2.0) - appropriate AIR-2.0 representative;
- c. Assistant Commander for Logistics Group (AIR-3.0) - Assistant Program Manager, Logistics (APML);
- d. Assistant Commander for Research and Engineering Group (AIR-4.0):
 - (1) APMSE, Systems Engineering Department (AIR-4.1);
 - (2) Empowered Team Members (appropriate AIR-4.x representatives);
 - (3) Assistant Program Executive Officer (Engineering) (APEO(E)); and
 - (4) FCO, AIR-4.0P.
- e. Assistant Commander for Test and Evaluation Group (AIR-5.0)/User Representative.

The program participants shall perform and maintain responsibility for the roles and functions described below.

6. Action. In the course of a system's acquisition life-cycle, there are salient activities during which key program decisions are made that set both the end-item configuration as well as the underlying process. Engineering technical reviews shall be conducted as part of these salient program decision activities. Enclosure (1) provides guidance for conducting engineering

technical reviews of new commercial-derivative aircraft programs. Enclosure (2) provides similar guidance for in-service updates to existing CDA programs.

a. Program Teams shall:

(1) engage the competencies early in the program. The appropriate NAVAIR competencies shall participate in the CDA acquisition process as early as possible and continuing throughout the program. Competencies shall provide empowered representatives to the program teams, and ensure stability in participation throughout program execution; and

(2) coordinate with appropriate NAVAIR competencies to evaluate any differences that exist between the FAA and United States Navy (USN) configuration and/or mission/usage. Where Navy usage or other factors differ from commercial operating envelopes/usage patterns, such differences will be identified early in the program to ascertain the extent of NAVAIR requirements and/or commercial certification applicability. Navy unique aspects will be incorporated into the commercial/FAA Certification to the maximum extent possible. If not included in the FAA Certification, unique Navy usage and support aspects shall be captured as technical risks with defined requirements for data/analysis to demonstrate risk mitigation. Together with the Commercial/FAA Certification, data and analysis will be funneled through the AIR-4.x engineering disciplines by the APMSEs to ensure engineering is performed with analysis and resulting risk mitigation. Upon concurrence of the working level engineers, the AIR-4.x Level II, his/her deputy, or empowered engineer will "chop" the flight clearance *to demonstrate that adequate risk mitigation has been accomplished.*

b. NAVAIR shall acquire and maintain knowledge of, and expertise in the following:

(1) in-depth understanding of the intended operational and training usage of the end item system in its intended environment;

(2) Federal Aviation Regulation (FAR) certification requirements;

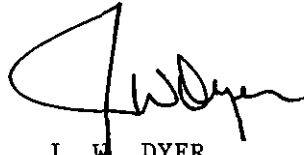
(3) FAA design, engineering, and test processes;

(4) OEM/FAA implementation policies;

(5) Designated Engineering Representative (DER) and other appropriate roles; and

(6) application of FAR guidelines to Navy commercial-derivative aircraft. This expertise shall be provided by NAVAIR participants to facilitate the maximum acceptance and application of commercially-derived certifications and data.

7. Review. AIR-4.1 shall review this instruction annually, and coordinate/implement updates and changes as appropriate.


J. W. DYER 30 MAR 02

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Engineering Technical Review of New CDA Aircraft Acquisition
or Major Modification Programs

1. Engineering technical reviews are applied to the acquisition and in-service support of CDA that are owned or operated by DoN. Commercial-derivative aircraft/systems fall into one of two categories; new aircraft acquisition or major modifications (described in this enclosure) or In-Service Engineering (ISE) and logistics support actions (described in enclosure (2)).

2. In the course of a system's acquisition and life-cycle, there are salient activities during which key program decisions are made that set both the end-item configuration as well as the underlying processes – we call these "Program Points". Decisions made at any given program point not only set the course for the following stage of the program, but also encapsulate the continuously maturing configuration under development; hence the requirement for a rigorous technical review at each program point. Of overarching importance is the consistency and flow of requirements from one program point to another. To facilitate this consistency, it is vitally important that each participating competency provides consistent support and technical review to the program and avoid to the maximum extent, changes in personnel. The program points called out below are in notional order, do not represent sequential activities, and may in fact overlap in program execution.

a. For new aircraft, or major modifications for which a FAA TC/STC exists at program initiation, Program Points 1, 2, 3, 6, 7, and 8 apply.

b. For new aircraft, or major modifications for which no TC/STC exists at program initiation, Program Points 1, 2, 3, 4, 5, 7, and 8 apply.

c. The following describes program points (1) through (8):

(1) Acquisition Planning/Documentation. Prior to finalization of the acquisition documentation, the IPT shall engage competency leadership as shown in Figure 1. The purpose of this technical review is a collaborative agreement of the overall acquisition approach. This program point initiates NAVAIR coordination with the goal of determining those broad engineering and technical issues that may affect acquisition documentation for commercial-derivative aircraft/systems. NAVAIR competencies shall participate as IPT members in this review with the competency leader or their empowered representative who is knowledgeable in FAA processes and OEM implementation policies. Results of this program point technical review will be identified and documented in the program's acquisition documentation.

(a) Agreement shall be reached on:

(1) assessment of intended mission/system usage to identify commercial common and Navy unique requirements and potential material solution alternatives;

(2) an initial assessment of NAVAIR competency support requirements; and

(3) the concept for support of the program since Commercial Logistics Support (CLS) differs from a traditional Navy organically supported program.

(2) Request for Proposal (RFP)/Performance Specifications/Statement Of Work (SOW)/Organic Support. Prior to finalization of performance specifications, SOW, and support plans, the IPT shall engage competency leadership as shown in Figure 1. The purpose of this program point technical review is a collaborative agreement on the overall support approach, derivation of the performance specification from the mission requirement, and the technical documentation. NAVAIR competencies shall participate as IPT members in this review with the competency leader or their empowered representative who is knowledgeable in FAA processes and OEM implementation policies.

(a) Policy. When the aircraft/system is operated within commercial common mission/usage, the FAA processes, certifications and data shall be accepted to satisfy applicable requirements. It is incumbent upon the IPT to provide a preliminary determination of the appropriate disciplines within the NAVAIR competencies for the acquisition/modification being considered. Results of this program point review will be identified and documented in the program's technical documentation and work unit plans.

(b) Agreements shall be reached which ensure:

(1) that the operational envelope and environment of the specified/proposed commercial-derivative aircraft/system satisfies the Navy requirements as defined in the requirements documentation (when a specific commercial solution has been mandated);

(2) application of FAA process and certifications for commercial common operational requirements; and

(3) recommendations for the SOW, Contract Data Requirements List (CDRL), certification data, performance specification and NAVAIR support plan to address Navy unique requirements.

(3) Source Selection/Source Selection Plan (SSP). This program point addresses NAVAIR coordination for conducting source selection of commercial-derivative aircraft/systems being acquired or modified. The process and participants are identified in Figure 1. NAVAIR competencies shall participate as IPT members in this review with the competency leader or their empowered representative who is knowledgeable in FAA processes and OEM implementation policies. This program point encompasses development of both the SSP and the source selection process. These are key aspects of the acquisition process, as it is here that the determination/selection of the aircraft/system is made. In most cases, the decision to acquire a FAA certificated aircraft/system will already have been specified in the requirements documentation. Therefore, it is not appropriate or necessary to develop source selection criteria that evaluates the FAA processes and approach. The SSP shall contain the critical performance/technical elements and the criteria that will be used to evaluate them. These criteria should be discrete, measurable and focused upon the intended usage/mission of the

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aircraft/system especially as it relates to unique Navy requirements. Source Selection participants must be knowledgeable in FAA procedures/processes and FAA airworthiness standards/requirements for certification. They must also possess a clear understanding of any Navy unique requirements in order to evaluate and assess the adequacy of the proposals in addressing these requirements. It is the contractor's approach and the applicability of the FAA processes in addressing the Navy unique deltas that shall be evaluated. The requirement for a new or amended TC/STC will be determined. For cases where the selected source requires a new/amended TC/STC the process notionally shown in Figure 2 will be applied in conjunction with program points 4 and 5. If the selected source involves use of an existing TC/STC then proceed to program point 6, configuration/engineering review.

(4) Requirements Verification Plan/Approach (including Test/Assessment). *This program point does not apply to new CDA acquisition/major modification programs for which FAA TC/STCs exist at program initiation.* The IPT shall engage competency leadership as shown in Figure 1 prior to finalization of verification planning and at appropriate steps along the TC/STC process as shown in Figure 2. The purpose of this program point is a collaborative agreement of the overall verification and certification approach as it matures during the development process. NAVAIR competencies shall participate as IPT members in this review with the competency leader (or their empowered representative) who is knowledgeable in FAA processes and OEM implementation policies. Verification planning shall be developed and coordinated by the APMSE.

(a) Agreement shall be reached on:

(1) key parameters identified in the Requirements Verification Plan. The plan will identify the method by which a parameter is verified (e.g., analysis or test), including responsible agencies (e.g., FAA, Navy); and

(2) all requirements being assessed, addressed, and reviewed by appropriate NAVAIR competencies, including the TC/STC Project Certification Plan. The intent is to assess the proposed plan/approach (and associated risk) relative to requirements and verify that all program requirements, including Navy unique, will be satisfied.

(b) Policy:

(1) for those program requirements that fall within commercial common mission/usage, the FAA processes, certifications and data shall be accepted to satisfy applicable verification requirements; and

(2) for those program requirements that fall outside of commercial common usage and are considered Navy unique, the OEM/FAA engineering data/methods/certifications shall be used to the maximum extent possible. Navy analyses/testing shall be identified to fulfill verification requirements over and above those required by the FAA. In the course of review of the TC/STC Certification Plan, opportunities for joint testing of Navy-unique requirements shall be explored.

Enclosure (1)

(c) Action. It is incumbent upon the IPT to provide a preliminary determination of the appropriate disciplines within NAVAIR competencies for the acquisition/modification being considered. Results of this program point review will be identified and documented in the program's requirements verification planning.

(d) Test/Assessment. The extent to which FAA testing satisfies Navy test requirements should have been initially evaluated during discussions for program point 1 and further defined during program points 2 and 3. Prior to finalization of test planning, the IPT shall engage competency leadership (to include Software Engineering Division (AIR-4.11) as shown in Figure 1. NAVAIR competencies shall participate as IPT members in this review with the competency leader (or their empowered representative) who is knowledgeable in FAA processes and OEM implementation policies. The purpose of the program point is to achieve a collaborative agreement on the overall test approach, as detailed below.

(1) Agreement shall be reached on:

(a) Navy-unique test requirements, with consideration for mission/usage of the aircraft, scope/depth of the FAA certification and/or all previous test efforts. Areas that should be considered for Navy-unique testing/assessment include but are not limited to: ship suitability, human factors, human systems integration, TEMPEST, stores separation, aerial refueling, mission suitability evaluation, interfaces with military unique equipment, reliability, maintainability, logistic supportability, training requirements, operator manuals, and other areas that commonly fall outside of FAA certification requirements.

(b) The nature and conduct of Navy unique testing and opportunities for joint testing addressed at each step in the TC/STC process. Navy and FAA testing should be integrated to the maximum extent possible. The objective should be to form an integrated team of FAA and Navy Developmental Testing (DT) and Operational Testing (OT) test personnel. This would include the utilization of joint (FAA, OEM and Navy) personnel in the conduct of the testing.

(c) Applicability of FAA-required test data. When a Navy commercial-derivative aircraft/system is being tested for certification by the FAA, and the Navy mission/usage is common to the commercial mission/usage, the FAA based flight test approach, methods, data, and assessments shall be utilized as the basis for satisfying Navy test requirements. Copies of the FAA-required flight test reports shall be provided to the appropriate NAVAIR competencies upon completion of the tests.

(d) Requirements for Navy flight testing. When specific Navy flight testing is required, the Navy Test Team will plan, perform, and report the testing following current NAVAIR and Commander Operational Test and Evaluation Force (COMOPTEVFOR) policies. The Navy Test Team will assess the test results against appropriate program and mission suitability requirements detailed in such documents as requirements documentation, performance specifications, and the Test and Evaluation Master Plan (TEMP).

Enclosure (1)

(5) Technical Reviews. *This program point does not apply to new CDA acquisition/major modification programs for which FAA TC/STCs exist at program initiation.* This program point addresses NAVAIR coordination for conducting technical reviews to assess progress of commercial-derivative aircraft/systems being acquired or modified. The technical review process and definitions are contained in reference (d), and shall be utilized where possible, recognizing that tailoring of this guidance may be required, as applied to the TC/STC process. Recommended participants for this program point are identified in Figure 1. It is incumbent upon NAVAIR competencies to provide the IPT with knowledgeable and empowered representatives to attend and participate in reviews. The purpose of technical reviews is for the NAVAIR (comprised of IPT, competency and contractor personnel) to ensure the design meets requirements throughout its life cycle, without compromising the benefits of commercial-derivative acquisition. While these reviews typically relate to the design of an aircraft/system under development, there is value in conducting technical reviews as part of the TC/STC process. The key is in understanding that while some aspects of such a procurement are inherently not subject to change, the methods of integration, installation, or choice of configuration often are. In commercial aviation, these methods and choices are typically determined by the customer and/or installer within the boundaries of the FARs. The intent of conducting technical reviews on CDA programs is to ensure that these methods and choices meet Navy requirements to the maximum extent possible within the boundaries of FARs and Commercial off the Shelf COTS/NDI.

(a) Policy

(1) For commercial-common design requirements, the NAVAIR shall accept OEM/FAA approved design, certification plans, verification approaches/methods and designees that fulfill FAA requirements (including underlying data), as the basis for design.

(2) For Navy unique design requirements, the NAVAIR shall evaluate and assess technical adequacy of the design following reference (d), FAA and competency guidelines.

(b) Discussion. During implementation of the TC/STC process NAVAIR actions shall ensure consistency of the commercial design with the requirements documentation, performance specification, SOW, NAVAIR competency requirements, CDRLs/delivered data, Reliability Verification Model, OEM/FAA certification requirements and the acquisition plan. The traceability of requirements, the design approach/method, the adequacy of the logistics, Reliability and Maintainability (R&M), production and mission suitability approach to integration and installation, and the certification plan will also be assessed. The risk factors will be assigned and cost factors identified as specified in reference (d). There are several technical, and three major design reviews:

(1) the System Requirements Review (SRR), which ensures that systems requirements have been completely and properly identified and that there is a mutual understanding between the government and the contractor. They are typically conducted prior to

Enclosure (1)

Milestone B and, for CDA programs, are held early in the TC/STC process (as part of the Certification Plan approval).

(2) the Preliminary Design Review (PDR), which confirms that the design is ready to proceed into the detailed design phase. For CDA programs, PDRs are notionally held subsequent to certification plan approval and prior to FAR compliance activities.

(3) the Critical Design Review (CDR) confirms that the detailed design is ready to proceed with coding, fabrication, assembly and integration efforts. For commercial-derivative aircraft programs CDRs are held prior to system fabrication and ground/flight testing. These design reviews are an integral part of the systems engineering process and are consistent with the existing and emerging commercial standards.

(c) Action. The PM shall ensure that the results of the technical and design reviews (overall technical assessment and resolved action items) are addressed by the IPT and are integrated into the management assessment of program technical, cost, and schedule risk.

(6) Configuration/Engineering Review. *This program point is only applied when an existing TC/STC results from source selection.* Subsequent to source selection a comprehensive review of the proposed FAA certificated configuration shall be conducted. All aspects of the system (design, maintenance, training plan, operator's manuals, etc) shall be assessed versus Navy requirements. Any engineering, logistics, training or operation and support issues shall be identified to the PM.

(a) These issues may include TC/STC compatibility with:

- (1) airworthiness requirements;
- (2) previous configuration changes;
- (3) unique physical and functional integration aspects;
- (4) structure, weight and balance;
- (5) Electromagnetic Environmental Effects (E^3), Electromagnetic Interference (EMI);
- (6) other system effects;
- (7) Navy unique usage factors, including unique training use of the end item system, human factors and Navy/support environmental effects;
- (8) Unique usage factors as they relate to the existing certification, existing maintenance plan, operators manuals, and training; and
- (9) Applicable OEM/FAA Technical Bulletins

Enclosure (1)

(b) All issues shall be characterized in terms of the Navy unique usage drivers, applicable commercial certification limitations, risk level, and risk mitigation options. These shall be presented to the PMA for resolution/further management action.

(7) Flight Clearance/Airworthiness. If a flight clearance is required by reference (b), the required engineering approvals leading to the issuance of flight clearance shall be addressed at program initiation and the focus shall continue throughout the program. The APMSE shall coordinate with appropriate competency disciplines to ensure engineering technical review team participants are assigned by the competency and that they are knowledgeable in FAA airworthiness design standards/requirements and processes for civil aircraft TCs/STCs.

(a) Agreement shall be reached on:

(1) the technical risk of the presented design configuration and proposed flight envelope relative to intended Navy mission/system usage;

(2) (for commercial-common environment, mission and usage) acceptance of the existing FAA certification data shall be a basis for the engineering technical review(s). For those cases where the program involves an existing TC/STC, it shall be used as the basis for the engineering technical review(s). For those cases where the selected source includes a new or amended TC/STC, and an airworthiness assessment is required prior to completion of the TC/STC process, the FAA issued TIA shall be used as a basis for the engineering technical review(s).

(3) (for Navy unique environment, mission, or usage) an engineering review shall be conducted to determine specific technical risk issues to be addressed. OEM/FAA engineering data/methods/certifications (approved TC/STC/TIA, as appropriate) shall be used to the maximum extent possible.

(4) The flight clearance be signed out by the appropriate competency-empowered team members (Performance Monitors) and should include the following:

(a) referenced TCs/STCs as applicable;

(b) an updated risk assessment approved by the competency-empowered team members; and

(c) any flight limitations required to mitigate the risk of Navy-unique operations/support judged to be outside the commercially-certified usage spectrum and not sufficiently mitigated during development and test.

(8) IOC/TDs/NATOPS/Maintenance Plan. Prior to finalization of a publication change, the IPT shall engage competency leadership as shown in Figure 1. The purpose of this program point is a collaborative agreement on the engineering basis of the proposed change.

Enclosure (1)

NAVAIR competencies shall participate as IPT members in this review with the competency leader (or their empowered representative) who is knowledgeable in FAA processes and OEM implementation policies.

(a) Agreement shall be reached on:

(1) The Engineering and Technical Content of the Preliminary NATOPS or NATOPS Changes. For commercial-common environment, mission and usage, acceptance of the existing FAA flight manual/Pilots Operating Handbook (POH)/Flight Crew Training Manual shall form the basis of the NATOPS manual. NATOPS inputs for Navy unique operations shall be developed following the procedures in reference (a). Following agreement, any preliminary NATOPS (or NATOPS change) shall also be submitted to the model manager or NATOPS advisory group as delineated in reference (a).

(2) The NATOPS manual shall be assessed using the process and participants outlined in Figure 1.

(3) Maintenance/inspection requirements must be reviewed for impact on/conflicts with Navy unique configuration, operation or maintenance. In those cases where conflict exists between Navy and commercial maintenance practice, the more stringent practice shall be used. If review reveals the changed practice or technique can not be accomplished due to Navy unique circumstances, it is incumbent on the IPT to resolve the issue by calling upon the originator of the change (i.e., OEM, FAA) and the appropriate discipline(s) of the NAVAIR Engineering Team to determine a mutually agreeable solution.

3. Figure 1 outlines the Engineering Technical Review Process deployment flowchart. This coordination process should be implemented at each applicable program point described above. Key to the engineering technical review process is the participation of all stakeholders in the collaborative agreement or resolution of issues throughout planning, development, and test. The specific competencies to be involved will depend on the nature and extent of the program's complexity and plan. However, at a minimum, engineering technical review shall occur among those offices identified in Figure 1.

a. Actions

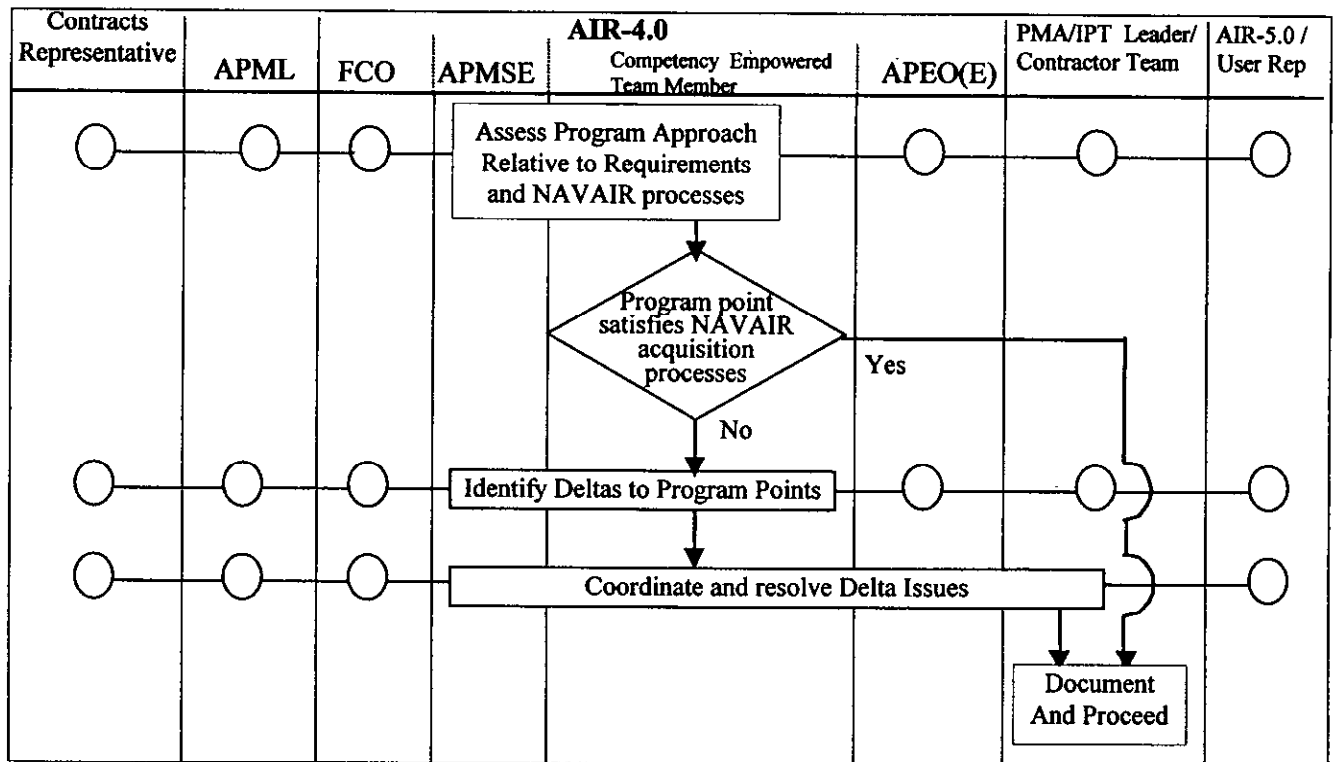
(1) Knowledgeable, empowered competency representatives (i.e., those fluent in both NAVAIR competency processes and FAA processes and able to render competency approval) assess the program's approach relative to requirements. Competency representatives will need to assess, balance, and trade-off conflicting requirements, identify and resolve issues, and collaborate on acquisition, design, development, and test issues pertaining to the program points as detailed above.

(2) The Program APMSE, in conjunction with AIR-4.0P, AIR-4.11, Chief Test Engineer and in coordination with AIR-4.0 competency leaders (at Level 3), shall ascertain what competencies should participate in the engineering technical review process and which

individuals will serve as competency-empowered team members. This agreement should be reached at the earliest point in a program and continuously revisited during the course of program execution – with the goal of consistent technical reviews.

(3) Conflicts not resolvable within the technical management framework shall be elevated to higher competency authority following NAVAIR Competency Aligned Organization (CAO)/IPT Concept of Operations (CONOPS). In no case shall a program point be closed with unresolved conflicts or issues. Issues, agreements, decisions, and participating stakeholders in the engineering technical review process shall be documented at each program point.

Engineering Technical Review Process



(This process is used for each relevant Program Point.)

Figure 1

New Aircraft Acquisition or Major Modifications Program Point Process Flow

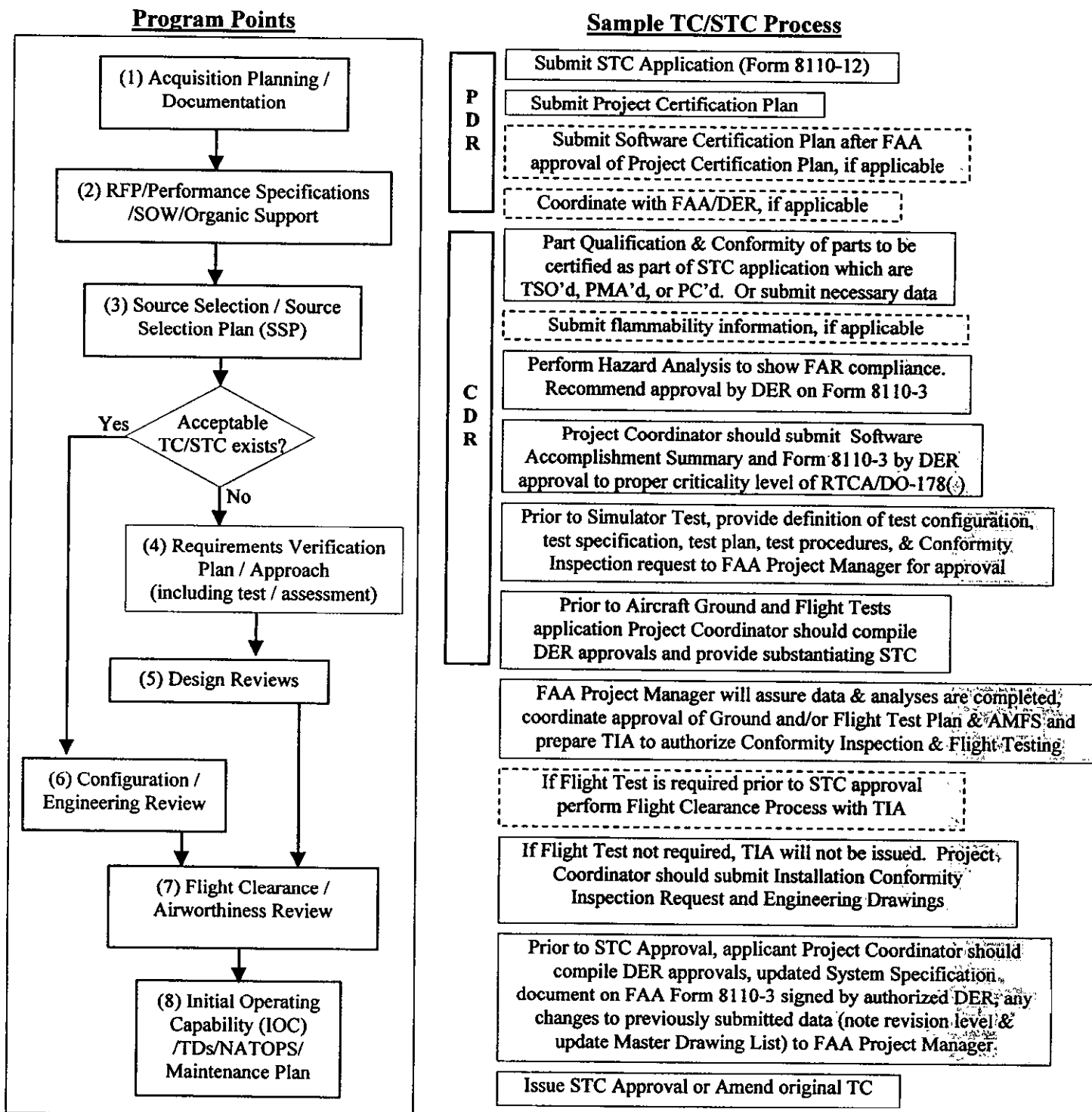


Figure 2

Engineering Technical Review of Existing Commercial-Derivative Aircraft In-Service
Engineering (ISE) and Logistics Support Actions

1. Engineering technical reviews are applied to the acquisition and in-service support of CDA that are owned or operated by the DoN. CDA/systems fall into one of two categories;
 - a. new aircraft acquisition or major modifications (described in Enclosure (1)); or
 - b. In-Service Engineering (ISE) and logistics support actions (described in this enclosure).
2. In the course of a system's life-cycle, there are salient activities during which program decisions are made that set the end-item configuration. ISE and logistics support actions applied to existing CDA program upgrades/configuration maturation require the same rigorous technical review as new CDA acquisition/major modification programs.
3. Reference (c), (Research and Engineering Technical Review of Risk Process and Procedures for Processing Grounding Bulletins) establishes policy, provides guidance, and assigns responsibilities for the technical review of risks. A technical review of risk shall be performed whenever ISE and logistics support actions are proposed for existing CDA programs. The process summarized in Figure 1 is invoked whenever an ISE action results in either, a Hazard Risk Index (HRI)-reference (c)) less than or equal to 17, or if the airworthiness of the system may be compromised. Airworthiness is determined by performing an engineering analysis to determine that an aviation system and/or its component parts meets minimum design criteria, standards, and configuration for conduct of safe flight operations. An engineering assessment must indicate the aviation system can be operated with an acceptable level of technical risk. Generally, the IPT APMSE is in the best position to make this judgement, but if doubt exists, it is incumbent on the APMSE to solicit advice from the appropriate competency(s), where NAVAIR technical accountability resides.
4. Prior to commencing any ISE action which meets the above criteria, the IPT shall engage competency leadership as shown in Figure 2. The purpose of this requirement is a collaborative agreement on the engineering basis of the proposed action. NAVAIR competencies shall participate as IPT members in this review with the competency leader (or their empowered representative) who is knowledgeable in FAA processes and OEM implementation policies. It is vitally important that each participating competency provides consistent support and technical review to the program and avoid, to the maximum extent, changes in personnel.
5. In order to ensure that Navy unique requirements are assessed and addressed, changes to aircraft configuration, operation or maintenance which are not of Navy origin (i.e. OEM Bulletins, FAA Airworthiness Directives (ADs), United States Air Force (USAF) Time Compliance Technical Orders (TCTOs), United States Army, Maintenance Work Orders (MWOs), etc.) must be reviewed by appropriate NAVAIR Engineering Team personnel. The intent is to assess the change relative to NAVAIR requirements and verify that any/all Navy unique requirements have been met. It is incumbent upon the IPT APMSE for the

aircraft/system to preliminarily determine the appropriate disciplines within the NAVAIR Engineering Team for review of the change.

a. Agreement shall be reached on:

(1) The engineering and technical content of the preliminary NATOPS or NATOPS changes. For commercial-common environment, mission and usage, acceptance of the existing FAA flight manual/POH shall form the basis of the NATOPS manual. NATOPS inputs for Navy unique operations shall be developed following reference (a). Once agreed upon, preliminary NATOPS or NATOPS changes shall be submitted to the model manager or NATOPS advisory group as described in reference (a). NATOPS shall be assessed using the process and participants described for maintenance/inspection requirements in the next subparagraph.

(2) Maintenance/inspection requirements must be reviewed for impact on/conflicts with Navy unique configuration, operation or maintenance. In those cases where conflict exists between Navy and commercial maintenance practice, the more stringent practice shall be used. If review reveals the changed practice or technique can not be accomplished due to Navy unique circumstances, it is incumbent on the IPT to resolve the issue by calling upon the originator of the change (i.e. OEM, FAA) and the appropriate discipline(s) to determine a mutually agreeable solution.

(3) Implementation of FAA/OEM/USAF/United States Army, Service Bulletins, letters, directives, orders, etc., since incorporation may require changes to configuration or maintenance or both.

6. Figure 1 is the process flow to be applied during ISE and logistics support actions for DoN commercial-derivative aircraft/systems. ISE and logistics support actions occur on aircraft currently in the Navy inventory. Typically, these actions are the result of the following:

- (a) manufacturer service bulletins;
- (b) FAA ADs;
- (c) Air Force Time Compliance Technical Orders (TCTOs);
- (d) Army MWOs;
- (e) existing FAA granted STCs;
- (f) Engineering Investigations (EIs); and
- (g) Safety/Hazard Reports, etc.

Engineering Change Proposals (ECPs) and Logistics Engineering Change Proposals (LECPs) may fall into either the aircraft modification or the ISE and logistics action categories.

**In-Service Engineering (ISE) and Logistics
Support Actions Process Flow**

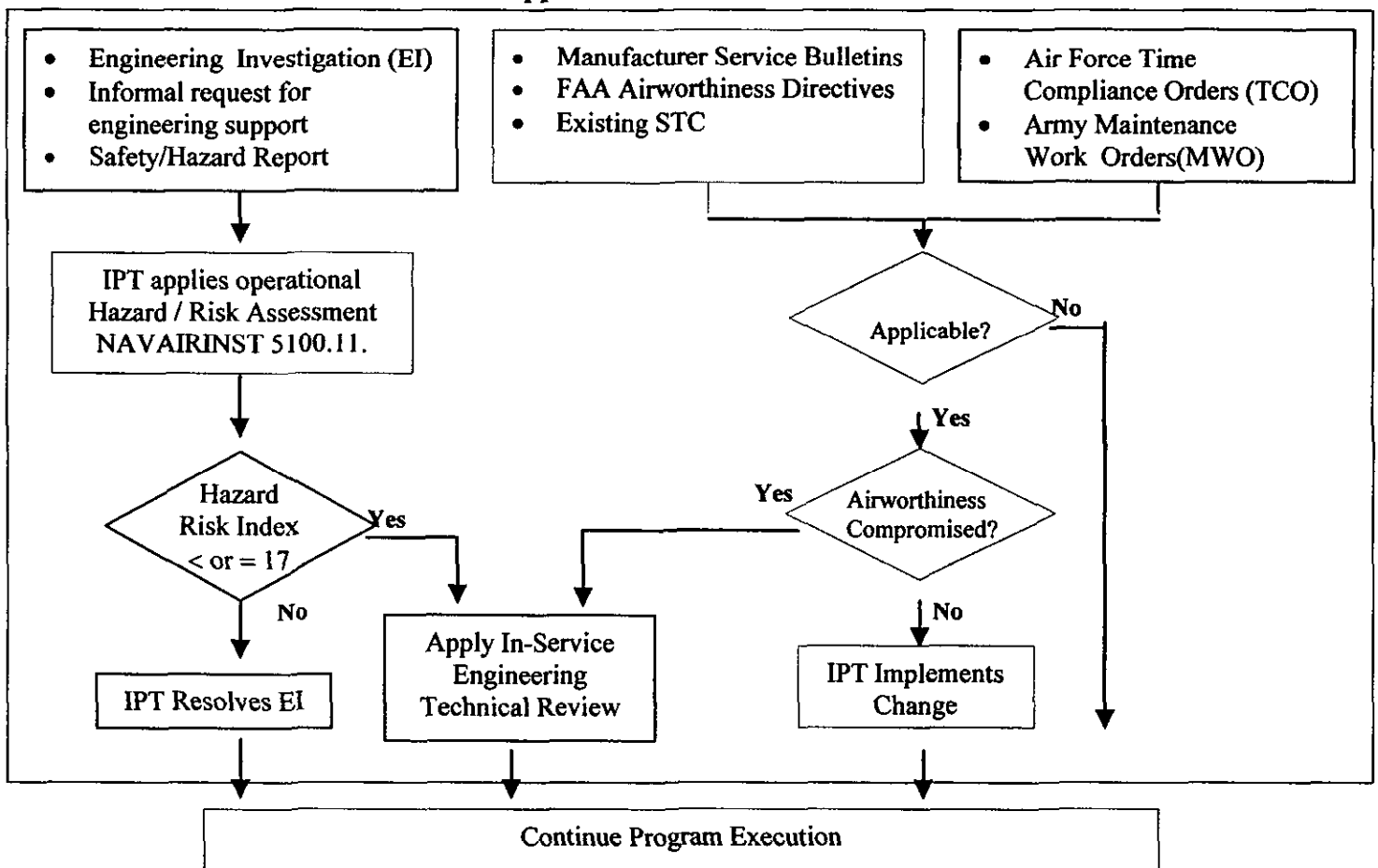


Figure 1

Engineering Technical Review Process

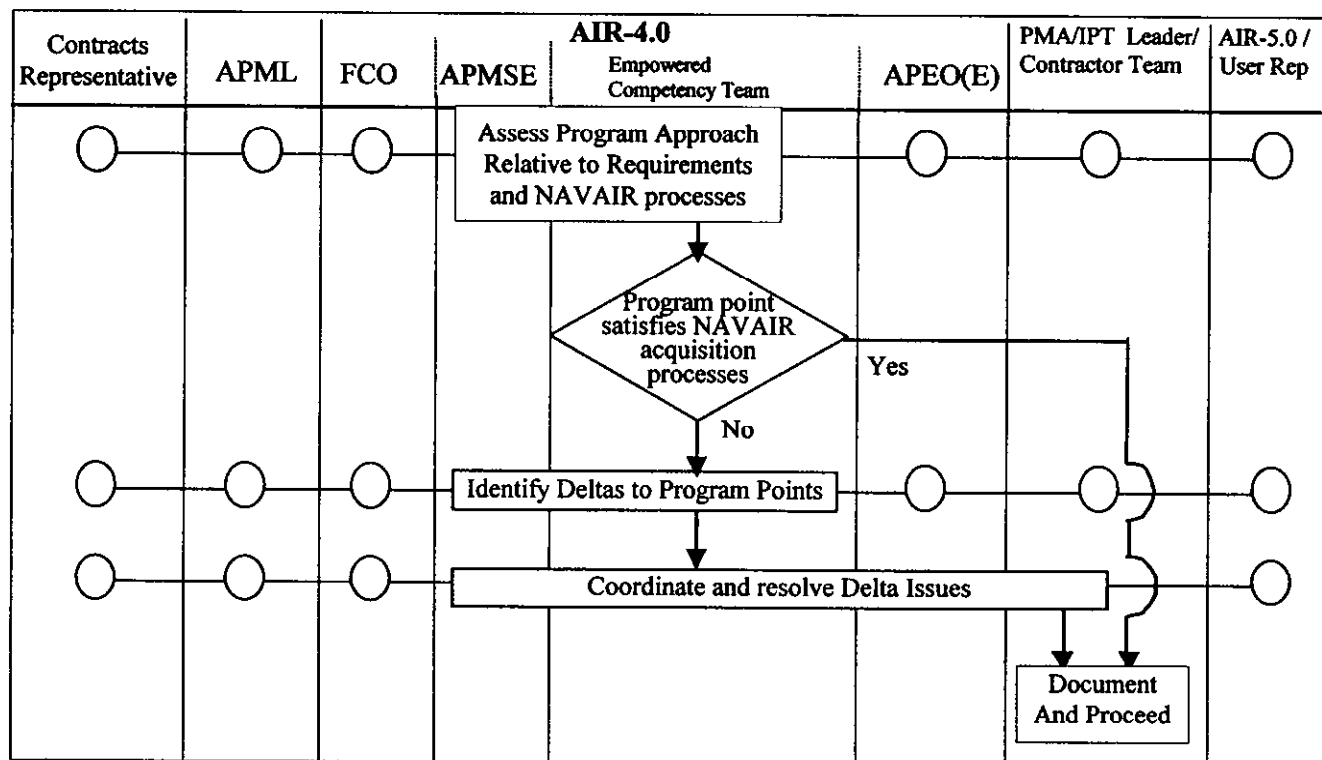


Figure 2